
**Footwear — Test methods for uppers
— Resistance to rubbing using a
rubber strip**

*Chaussures — Méthodes d'essai pour les tiges — Résistance au
frottement à l'aide d'une bande en caoutchouc*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 216, *Footwear*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Footwear — Test methods for uppers — Resistance to rubbing using a rubber strip

1 Scope

This document specifies a method for the determination of the rubbing resistance of leather and synthetic materials using rubber.

The method aims to establish testing conditions that are similar to those of the practical use of footwear subjected to drastic stress, as is the case of hiking or children's footwear, where the upper of one of the shoes is expected to rub with the sole of the other.

This method is applicable to all types of leather and synthetic materials intended for shoe uppers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 18454, *Footwear — Standard atmospheres for conditioning and testing of footwear and components for footwear*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

The shoe upper material is drastically rubbed with the abrading rubber element under a given pressure for a given number of 'to-and-fro' motions (cycles).

5 Apparatus

The test apparatus suitable for this test shall incorporate the following elements:

5.1 A carriage with the following:

- a) horizontal, completely planar metal platform;
- b) holder for fastening the material to be tested leaving 80 mm freely exposed;
- c) device that allows the test-piece to be extended at least 10 % in the direction of rubbing.

5.2 A finger, of mass (500 ± 25) g, removable but able to be fixed firmly, provided with

- a) a base formed by a wooden or metallic semi-cylinder measuring 10 mm radius $\times$ 20 mm wide,
- b) a device for attaching the rubber strips on the wooden semi-cylinder base (see [Figure 1](#)),
- c) an additional weight of mass (500 ± 10) g, and
- d) means for guiding the finger when fully loaded (total mass $1\,000 \pm 35$ g) flat on the test piece, stretched or not, as appropriate.

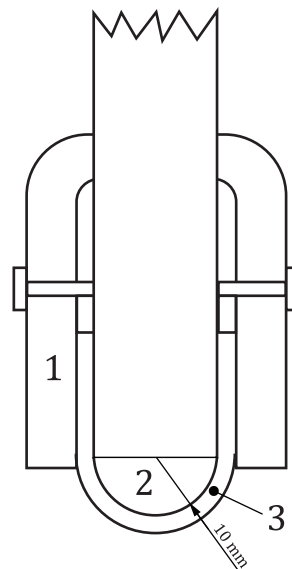
5.3 Means for driving the carriage ([5.1](#)) to and fro with

- a) a distance travel of 35 mm to 40 mm, and
- b) a frequency of (40 ± 2) cycles/min.

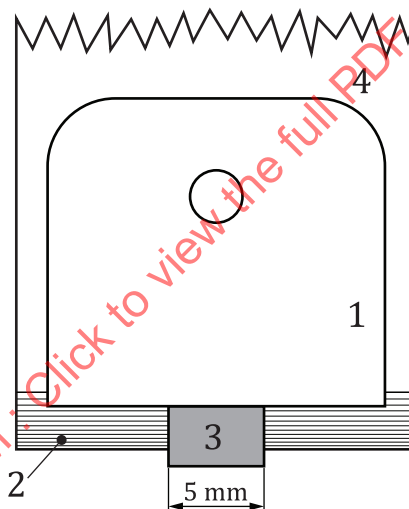
NOTE 1 The following items are convenient but not essential parts of the equipment:

- a) means to move the finger at right angles to the direction of rubbing, so that two or three tracks can be used for rubbing on one test piece;
- b) a motor to drive the carriage to and fro ([5.3](#));
- c) means to pre-select a given number of cycles.

NOTE 2 This test apparatus is similar to the one specified in ISO 11640 for the determination of the colour fastness to to-and-fro rubbing of leather, to which the wooden semi-cylinder of 10 mm radius and 20 mm wide is attached on the base of the finger ([5.2](#)) and a suitable device is coupled for attaching the rubber strips.



a) Side view



b) Front view

Key

- 1 clamp
- 2 wood or metal
- 3 rubber
- 4 finger

Figure 1 — Rubbing finger

5.4 Rubbing material, a $(5,0 \pm 0,1)$ mm wide, (5 ± 1) mm thick, $(75 \pm 3)^\circ$ Shore A hardness nitrile rubber strip with a friction coefficient of $0,20 \pm 0,05$ (see [Figure 1](#)), the surface of which shall be previously roughened (see the note in [7.2.3](#)). Use preferably a light-coloured material to avoid staining the sample.

5.5 Beaker or other suitable vessel.

5.6 Grey scale, in accordance with ISO 105-A02, for assessing the change in colour of leather or synthetic materials.

5.7 Vacuum desiccator or other suitable vessel for evacuation.

5.8 Vacuum pump, capable of evacuating the vessel (5.5) and achieving 5 kPa (50 mbar, approximately 40 Torr) in 4 min.

6 Preparation of test pieces

Test piece shall be free from sewing thread, decorative part, hook and eyelet.

6.1 Dry rubbing resistance

Cut a test piece measuring approximately 120 mm × 70 mm for each one of the sample directions.

Condition test pieces in accordance with ISO 18454 for a minimum of 24 h.

6.2 Wet rubbing resistance

Cut a test piece measuring approximately 120 mm × 70 mm for each one of the sample directions. To ensure uniform wetting, proceed as follows:

Immerse the test-piece in distilled water and place the containing vessel (5.5) in the vacuum desiccator (5.7). Produce a vacuum of 5 kPa (5.8) and hold it for 2 min. Restore normal pressure. Carry out this procedure two more times. Allow the test piece to soak in the water at $23\text{ °C} \pm 2\text{ °C}$ at atmospheric pressure for 30 min. Take the test-piece out of the water and remove excess water on its surface with blotting paper, and then start the test.

No conditioning is required for the wet test.

7 Procedure

7.1 Dry rubbing resistance

7.1.1 Mount the test-piece (6.1) on the apparatus (Clause 5) and stretch it 10 %, or stretch it sufficiently to avoid the formation of creases.

7.1.2 Attach a rubber strip (5.4) to the wooden semi-cylinder and hold it adequately. Place the finger with the rubber strip 15 mm from the left long edge. Carry out 10 cycles and lift the finger off the test-piece.

7.1.3 Move the rubber strip a little bit to one side, so a non used part of the strip is in front of the test piece during the test, or replace the strip with a new one. Place the finger with the rubber strip 15 mm to the right of the previous position. Carry out 20 cycles and lift the finger off the test-piece.

7.1.4 Move the rubber strip a little bit to one side, so a non used part of the strip is in front of the test piece during the test, or replace the strip with a new one. Place the finger with the rubber strip 15 mm from the right long edge. Carry out 30 cycles and lift the finger off the test-piece.

7.1.5 Release the test-piece and assess the rubbed areas.

7.2 Wet rubbing resistance

7.2.1 Mount the wetted test-piece (6.2) on the apparatus, stretch it 10 %, or stretch it sufficiently to avoid the formation of creases.

7.2.2 Proceed as described in 7.1.2, 7.1.3 and 7.1.4, but carrying out 5, 10 and 20 cycles, respectively.

7.2.3 Release the test piece and leave it to dry at ambient temperature before assessment.

NOTE The rubber strips can be prepared or regenerated before use by mounting them on the test-piece holder and carrying out 5 cycles using a 100 grit abrading fabric attached to the wooden semi-cylinder.

8 Expression of results

8.1 In the dry test (7.1), for each group of cycles (10, 20 or 30 cycles), assess the change in colour of the leather or synthetic material using the grey scale, in accordance with the ISO 105-A02. For each group of cycles, record any visible change in the surface of the test-piece, e.g. loss of finish, development of polish, flattening of the nap, destruction of finish, etc.

8.2 In the wet test (7.2), after drying the test piece, assess it as described in 8.1 for each group of cycles (5, 10 and 20 cycles).

NOTE For visual assessments using the grey scale, an inter-person precision of $\pm 0,5$ Grey Scale units is considered acceptable.

9 Test report

The test report shall include the following information:

- a) a reference to this document, i.e. ISO 24265:2020;
- b) a full description of the sample tested;
- c) the test results, expressed in accordance with [Clause 8](#);
- d) details of any deviation from the procedure described in this document, such as the extension applied, if different from 10 %;
- e) details of any incidence occurred during the test which may affect the results;
- f) date of the test.